

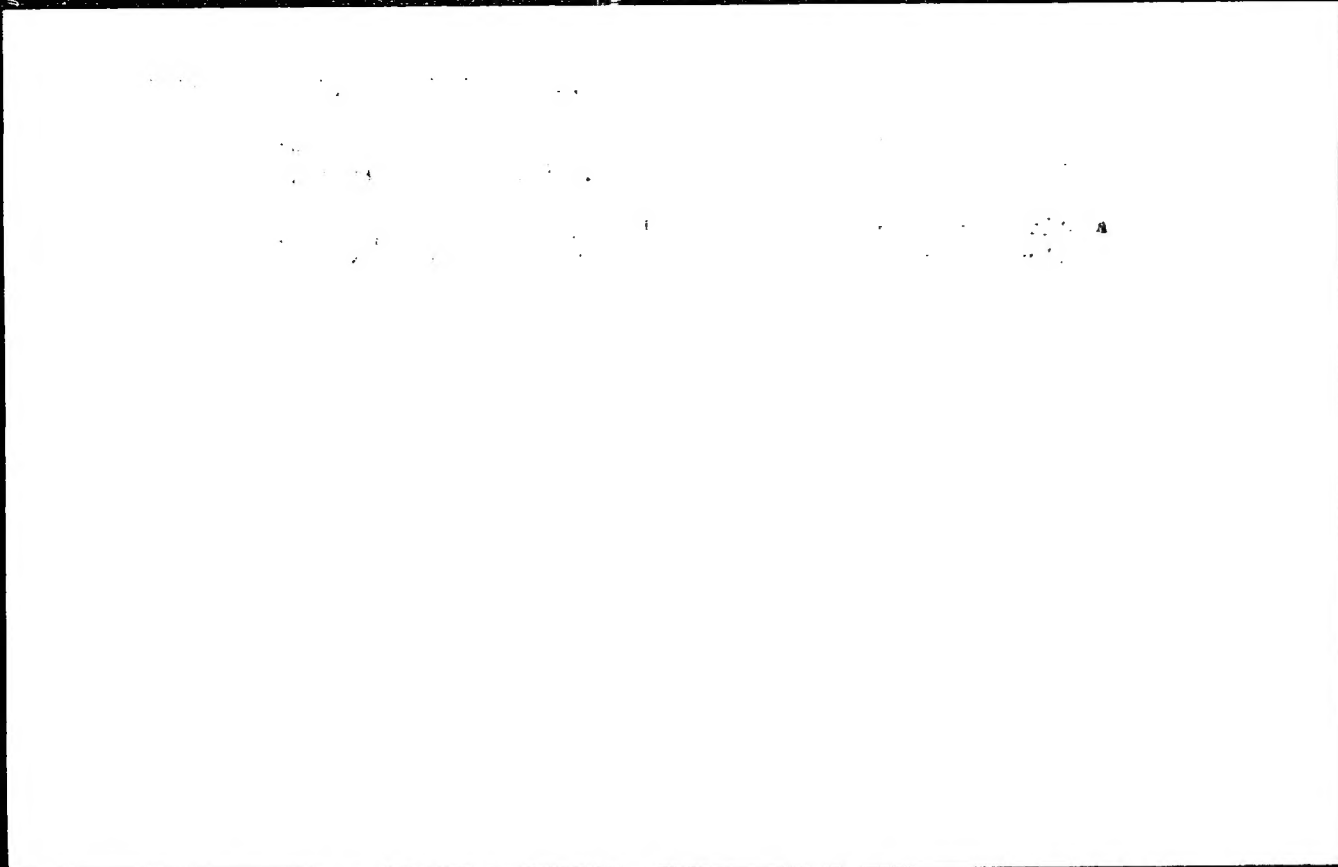
OPARIN, A.I.; LUKOYANOVA, M.A.; SHVETS, V.I.; GEL'MAN, N.S.; TORIKHOVSKAYA, T.I.

Role of lipids in the organization of enzymatic chains of electron transfer in *Micrococcus lysodeikticus*. Zhur. evol. biokhim. i fiziol. 1 no.1:7-15 Ju-F '65. (MIRA 18:6)

1. Institut biokhimii im. A.N. Bakha AN SSSR i Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V. Lomonosova.

"APPROVED FOR RELEASE: Tuesday, August 01, 2000

CIA-RDP86-00513R001238



APPROVED FOR RELEASE: Tuesday, August 01, 2000

CIA-RDP86-00513R0012381

OPARIN, A.I.; DEBORIN, G.A.

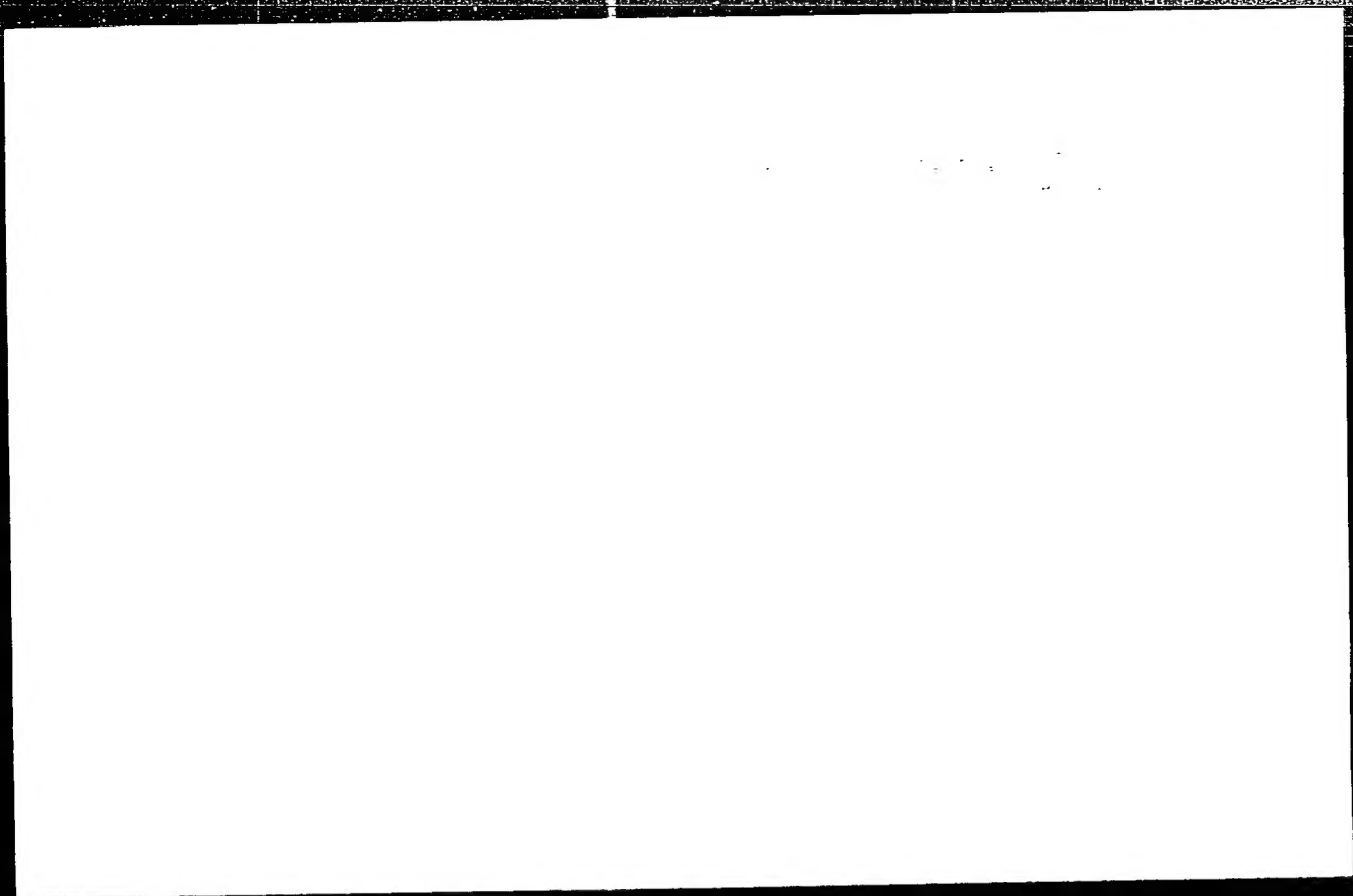
Modeling an active transfer of protein into lipid membranes.
Ukr.biokhim.zhur. 3 no.5/1976. 68-70.

(MIRA 18:10)

1. Institut biokhimii im. A.N.Bazha AN SSSR, Moskva.

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OPARIN, A.I., akademik; SEREBROVSKAYA, K.B.; LOZOVAYA, G.I.

Photosensitizing activity of chlorophyll-a in a phosphatide-protein
coacervate system. Dokl. AN SSSR 162 no.1418-1419 Je '65. (MIRA 18:7)

1. Institut biokhimii im. A.N.Bakha AN SSSR i Institut botaniki AN UkrSSR.

METLITSKIY, Lev Vladimirovich; KORABLEVA, Natal'ya Pavlovna;
OPARIN, A.I., akademik, otv. red.; MATVEYENKO, T.A.,
red.

[Biochemistry of dormancy of the storage organs of plants;
the nature of dormancy and methods of its control] Biokhi-
mii pokoia zapasaiushchikh organov rastenii; priroda po-
koia i metody upravleniia. Moskva, Nauka, 1965. 91 p.
(MIRA 18:11)

DEBORIN, G.A.; TYURINA, I.P.; TORKHOVSKAYA, T.I.; QUARIN, A.I.

Enzymatic splitting of ribonucleic acid separated from
nuclease by a lipid membrane. Zhur. evol. biokhim. i fiziol. 1
no. 6:550-556 N-D '65 (MIRA 1965)

1. Institut biokhimii imeni A.N. Bakha AN SSSR, Moskva. Sub-
mitted May 24, 1965.

27109-66 ENT(1) SCTB DD

SOURCE CODE: UR/0020/65/162/006/1418/1419

ACC NR: AP6017473

AUTHOR: Oparin, A. I. (Academician); Serebrovskaya, I. B.; Losovaya, G. I. 30
B

ORG: Institute of Biochemistry im. A. N. Bakh, AN SSR (Institut biokhimii AN SSSR); Institute of Botany, AN UkrSSR (Institut botaniki AN UkrSSR)

TITLE: Photosensitizing activity of chlorophyll A in a phospholipid-protein coacervate system

SOURCE: AN SSSR. Doklady, v. 162, no. 6, 1965, 1418-1419

TOPIC TAGS: chlorophyll, protein, biochemistry, plant chemistry, ascorbic acid

ABSTRACT: The purpose of the investigation was to obtain phospholipid coacervates containing chlorophyll and to study the sensitizing activity of pigment therein. Horse serum albumin was used as the protein component of the coacervate, with lecithin isolated from fresh ox brain as the lipid component. Chlorophyll A was obtained by separating a mixture of pigments isolated from dry nettle leaves. The lipoprotein coacervate was prepared by mixing lecithin ash containing chlorophyll with a protein solution. The photosensitizing capacity of chlorophyll in the coacervates was determined by the reduction of methyl red reduction by ascorbic acid. The mixture used for this purpose consisted of 4 ml of coacervate suspension, 0.05 ml of methyl red, and 40 mg of ascorbic acid. To establish the photochemical role

Card 1/2

ACC NR: AP6010550

(A)

SOURCE CODE: UR/0026/65/000/011/0017/0025

AUTHOR: Oparin, A. I. (Academician)

ORG: none

TITLE: Biochemistry and the food industry

SOURCE: Priroda, no. 11, 1965, 17-25

TOPIC TAGS: nutrition, food technology

ABSTRACT: Numerous examples are presented to support the author's contention that scientific methods must be used in various branches of the food processing industry to assure that the public is provided with the proper type of food. Examples cited show that as human knowledge of the vital process is increased, the number of known compounds necessary to produce correct metabolism also increases. Methods of processing foods must be such that they do not destroy these important compounds. The machine processing of food requires objective, biochemical quality control. The quality of raw products, storage conditions, pertinent new technological techniques, and the utilization of byproducts are discussed. Special attention is given to a discussion of methods of gamma irradiation of vegetables which were first tested on an industrial scale in the SSSR in 1964. Orig. art. has: 2 figures.

SUB CODE: 06,02/

SUBM DATE: none

UDC: 5777.1

Cord 1/1

OPARIN, D.

Quantitative relationships in schemes of capital reproduction.
Vop.ekon. no.11:145-153 N '59. (MIRA 12:12)
(Marx, Karl, 1818-1883) (Economics)

OPARIN, D.

Calculating the indices of national income in models of the national
economy. Vop. ekon. no.7:102-109 J1 '63. (MIRA 16:8)
(Income) (Economics, Mathematical)

OPARIN, D I.

- 1) A. B. Kuznetsov - The Differential Equations of Expanded Reproduction
 - 2) I. V. Kuznetsov - Optimal Planning and Economic Indicators
 - 3) A. A. Buzov - Mathematical Analysis of the Optimal Competition of Production
 - 4) S. I. Buzov - Mathematical Analysis of Prices and Proportions in the National Economy (Primarily in Determining the Economic Efficiency of Capital Investment)
 - 5) S. I. Buzov, S. P. Kuznetsov - Price Relationships in Expanded Reproduction
 - 6) S. I. Buzov and V. A. Kuznetsov - Statistical (and) and Dynamic Models of a Socialist National Economic Balance in Physical Terms
- a. Working Session - 15 December 1959, 1600 hours
- II. The Theory of Linear Programming
- 1) S. S. Kuznetsov - Review of Methods for the Solution of Linear Programming Problems
 - 2) A. I. Kuznetsov - Algorithmic Solutions of Transport Problems (Based on the Method of Hypothetical Flows)
 - 3) S. P. Kuznetsov - The Algebra of Linear Programming
 - 4) S. V. Kuznetsov - Recommendations for a Method of Re-estimating the Coefficients of Total Linear Programming under Conditions of Changing Technology
 - 5) S. Kuznetsov - A Practical Application of Linear Programming in Controlling Multiphase
 - 6) S. Kuznetsov and Kuznetsov - Linear Programming Methods and Material Supply
4. Working Session - 15 December 1959, 1000 hours
- III. Economic Models and Dynamic Programming
- 1) V. V. Kuznetsov - Mathematical Models of the National Economy in Economic Dynamics and a Critique Thereof
 - 2) S. S. Kuznetsov - Mathematical Methods of Determining the National Efficiency of Capital Investment
 - 3) V. V. Kuznetsov - Concerning the Economic Cycle Models and Dynamic Economic Models of Economic Dynamics
 - 4) V. V. Kuznetsov - Problems in the Application of Dynamic Programming in Economic Research
 - 5) I. Kuznetsov - Single-Product Economic Models and the Analysis of Certain Economic Indicators
 - 6) V. I. Kuznetsov - The Dynamic Programming Method and Its Use in Economic Research
 - 7) S. I. Kuznetsov - Building (Economic) Models as a Model for the Application of Mathematical Methods in Long-Term Economic Planning
- a. Working Session - 15 December 1959, 1600 hours
- IV. The Transportation Problem
- 1) S. I. Kuznetsov - Finding the Most Suitable Assignment of Various Types of Fleet Vessels to Lines
 - 2) A. S. Kuznetsov - Extremal Methods in Economic Research on the Optimal Spatial Distribution of Projects
 - 3) S. P. Kuznetsov - The Application of Linear Programming to Air Transport Research

OPARIN, Dmitriy Ivanovich, prof. statistiki doktor ekonom. nauk;
PLISKINA, Ye. K., red.

[Multilateral scheme for the functioning of the national
economy] mnogostvornaya skhema funktsionirovaniya narod-
nogo khozyaystva. Moskva, Nauka, 1965. 179 p.
(MIRA 18:8)

1. Chlen Nauchn. gr. Soveta AN SSSR po primeneniyu matematiki
i vychislitel'noy tekhn. v ekonomicheskikh issledovaniyakh
i planirovani. (for Oparin.)

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OPARIN, I.A.

Effect of tactile stimulation from moving air on gas exchange in dogs. Opyt izuch.reg.fiziol.funk. no.3:129-138 '54. (MLRA 8:12)

1. Kafedra gigiyeny Leningradskogo Gosudarstvennogo pediatricheskogo meditsinskogo instituta i Laboratoriya ekologicheskoy fiziologii Instituta fiziologii imeni I.P.Pavlova Akademii Nauk SSSR.
(BODY TEMPERATURE) (RESPIRATION)

OPARIN, I. A.

Effect of tactile stimulation from moving air on gas exchange and skin temperature in man. Opyt izuch.reg.fiziol.funk. no.3:139-145 '54. (MIRA 8:12)

1. Kafedra gigiyeny Leningradskogo Gosudarstvennogo pediatricheskogo meditsinskogo instituta i Laboratoriya ekologicheskoy fiziologii Instituta fiziologii imeni I.P.Pavlova Akademii nauk SSSR.
(BODY TEMPERATURE) (RESPIRATION)

MOCHALOV, V.A.; MATYUSHCHENKO, D.D.; KRIVITSKIY, A.A.; GLEZER, G.N.;
OPARIN, I.M.; KHEYMAN, E.L.; SMETNEV, N.N.; EPSHTEYN, A.L.;
GUSEV, B.Ya.; LEYKIN, L.P.; MARCHENKO, G.M.; FISHKOV, V.G.;
SAPROVSKIY, S.V.; LYAKHOVSKIY, I.I.; SMELYAKOV, Ye.P.; VAYNTRAUB,
D.A.; BUDYLIN, M.M.; NOTKIN, Ye.M.; KUR, G.Ye.; ARONSHTEYN, N.A.;
SUKHAREV, V.I.; VINOGRADOV, K.N.; BOBROVSKIY, N.S.

Innovators' certificates and patents. Mashinostroenie no. 2:
103-109 Mr-Ap '64. (MIRA 17:5)

L 5291-66

ACC NR: AP5022026

SOURCE CODE: UR/0286/65/000/014/0098/0098

AUTHORS: Gleser, G. M.; Oparin, I. M.; Kheyman, E. L.

31
23

ORG: none

TITLE: Transistorized chopper. Class 46, No. 173067

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 98

TOPIC TAGS: engine ignition system, transistorized circuit

ABSTRACT: This Author Certificate presents a transistorized chopper, e.g., for battery ignition systems of internal combustion engines. To protect the transistorized chopper from voltage surges when switching the ignition coil current, a varistor is connected in parallel with the collector-base junction of the transistorized chopper.

SUB CODE: PR, EC/ SUBM DATE: 01Feb64/ ORIG REF: 000/ OTH REF: 000

BC
Card 1/1

0901 0481

L 5292-66

ACC NR: AP5022028

SOURCE CODE: UR/0286/65/000/014/0099/0099

AUTHORS: Gleser, G. N.; Oparin, I. M.; Kheyman, E. L.

ORG: none

TITLE: Battery ignition system for internal combustion engines. Class 46,
No. 173069

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 99

TOPIC TAGS: engine ignition system, transistorized circuit

ABSTRACT: This Author Certificate presents a battery ignition system for internal combustion engines. The system contains a dc supply, an ignition coil, transistors (one or more), a chopper, and a transformer. The primary of the ignition coil is connected in the emitter-collector circuit, the chopper contacts are connected in the base circuit, and the secondary of the transformer is connected in parallel with the base-emitter junctions (see Fig. 1). To simplify the design, the primary of the transformer is connected in parallel with the primary of the

Card 1/2

0901484

L 5292-66

ACC NR: AP5022028

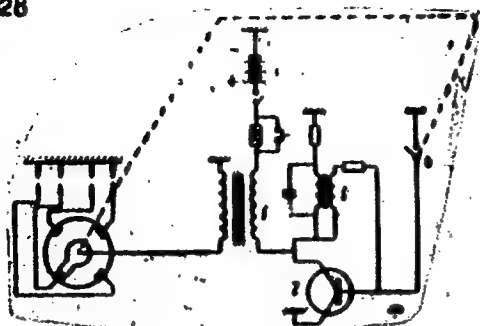


Fig. 1. 1- dc supply;
2- transistor; 3- primary
of ignition coil;
4- chopper; 5- secondary
of transformer

ignition coil. Orig. art. has: 1 diagram.

SUB CODE: FR/

SUBM DATE: 26Dec62/

ORIG REF: 000

OTH REF: 000

BC
Card 2/2

L 20927-66 EWT(1)/FSS-2/ETC(1)/EWG(m)

ACC NR: AP6002579

SOURCE CODE: UR/0286/65/000/023/0071/0071

AUTHORS: Gleser, G. N.; Oparin, I. M.; Kheyman, E. L.

ORG: none

TITLE: Battery ignition system for internal combustion engines. Class 46, No. 176752

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 71

TOPIC TAGS: internal combustion engine component, engine ignition system

ABSTRACT: This Author Certificate presents a battery ignition system for internal combustion engines. The system contains a dc source, an ignition coil, a transistor, and a transformer. The primary of the ignition coil is connected in the emitter-collector circuit of the transistor, and the breaker contacts are connected in the base circuit. The transformer secondary is connected in parallel with the base-emitter junction of the transistor. To create active cutoff of the transistor with minimal values of power and transformer size, the transformer primary is connected in series with the breaker contacts in the base circuit of the transistor (see Fig. 1). To improve the operating characteristics, several

Card 1/2

UDC: 621.43.044.9

L:20927-66

AOC NR: AP6002579

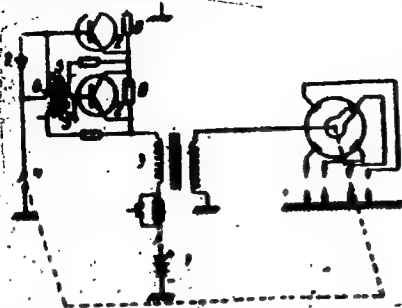


Fig. 1. 1 - dc source; 2 - transistors;
3 - coil primary; 4 - breaker; 5 - transformer
secondaries; 6 - transformer primary;
7 - protective diode; 8 - resistances.

transistors are connected in series (the collector of one transistor is connected to the emitter of the other). The bases are connected in parallel through protective diodes. The base-emitter junctions are shunted by the transformer secondaries. The transformer primary is connected in the base circuit of one or several transistors. To equalize the transistor voltages, equal resistances are connected between the emitter and collector of each transistor. Orig. art. has: 1 diagram.

SUB CODE: 21/ SUBM DATE: 26Nov62

Card 2/2 ULR

L 27894-66 EWT(1)

ACC NR: AP5022027

SOURCE CODE: UR/0286/65/000/011/0099/0099

AUTHORS: Glezer, G. N.; Oparin, I. M.; Kheyman, E. L.

ORG: none

TITLE: Contactless detector. Class 46, No. 173068

SOURCE: 'Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 99

TOPIC TAGS: engine ignition system, transistorized circuit

¹⁰
ABSTRACT: This Author Certificate presents a contactless detector for controlling a transistorized chopper in a battery ignition system of internal combustion engines. The detector contains a power supply, an induction coil, and a transistorized chopper. To increase the amplitude stability of the controlling pulse with changes in engine speed and the operation reliability of the whole ignition system, the detector is in the form of a self-excited oscillator with variable magnetic coupling between the tank circuit coils. Feedback is varied with a shaped screen which is connected to the engine shaft and is rotated between the magnetic circuits of the mentioned coils.

Card 1/2

090104.82

L 27894-66

ACC NR: AP5022027

SUB CODE: PR, EC/

SUBM DATE: 04Jul63/

ORIG REF: 000/

OTH REF: 000

Card 2/2

L 44572-66

ACC NR: AP6015721 (A) SOURCE CODE: UR/0413/66/000/009/0169/0169

INVENTOR: Oparin, I. M. ; Glezer, G. N. ; Kheyman, E. L.

5
B

ORG: none

TITLE: Battery ignition system. Class 46, No. 152362

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 9, 1966, 169

TOPIC TAGS: ignition system, battery ignition system

ABSTRACT: This Author Certificate introduces a battery ignition system for engines with carburetors consisting of battery, ignition coil, contact breaker, and two semiconductor triodes used as a current commutator in the primary winding of the ignition coil. To improve ignition reliability, the semiconductor triodes are connected in series with respect to current and reverse voltage, while the primary winding of the ignition coil is connected into the emitter or collector circuit. To increase the power of the ignition coil at low breaking current on the breaker contacts, the primary

Card 1/2

L 44572-66

ACC NR: AP6015721

0

winding of the ignition coil is divided into two sectors in phase opposition to each other. One sector is in the collector circuit of the first triode and the other is in the emitter circuit of the second triode. [Translation] [LD]

SUB CODE: 21/ SUBM DATE: 29Dec61/

Card 2/2 *sqm*

OPARIN, Mikhail Fedorovich; SATURIN, Boris Mikhaylovich; FREGER, D.P., red. izd-
va; SUKHOV, I.V., inzh., red.; BELOGUROVA, I.A., tekhn. red.

[Device for determining dimensions of oblique triangles] Pribor dlia
operedeleniia parametrov kosougol'nykh treugol'nikov. Leningrad, 1961.
11 p. (Leningradskii Dom nauchno-tekhnicheskoi propagandy. Obmen pere-
dovym opytom. Seriya: Mekhanicheskaiia obrabotka metallov, no.1)

(MIRA 14:7)

(Rulers (Instruments).)

OPARIN, N., tokar', deputat.

In the quota for 1956. Zhil.-kon.khoz. vol.3 no.4:22-29 S '5 . (Mlad 5:4)

1. Leningradskiy liteyno-mekhanicheskiy zavod Tresta prompredpriyatiy Leningradskogo upravleniya zhitishchnym khozyaystvom. 2. Leningradskiy gorodskoy Sovet. (Zencets)

OPARIN, N.; D'YACHENKO, V.

Improve the publicizing of innovators' experience. Sets.trud no.1:
124-127 Ja '56. (Efficiency, Industrial) (MLRA 9:7)

OPARIN, N.

Economic program of British Laborites. Vop. ekon. no. 4:56-55
Ap '62. (MIRA 14..)

(Great Britain--Labor party)

OPARIN, N.A.; YEVGEN'YEV, Ye.M.

Detection of spermatozooids by direct microscopy of stains on the
object. Sud.-med. ekspert. 4 no. 1:38-40 Ja-Mr '61. (MIRA 14:4)

1. Kafedra sudebnoy meditsiny (zav. - prof. M.G. Bereza) Kazanskogo
meditsinskogo instituta.

(MICROSCOPY—TECHNIQUE) (SPERMATOOA—JURISPRUDENCE)

ANIKIYEV, K.A.; VYSKOOSTROVSKAYA Ye.B.; KOCHKIN G.B.; OPARIN, O.M.

Uranium and thorium in igneous rocks of the Uymen' Depression
(Gornyy Altai). Inform.sbor. VSEGBI no.22 41-54 '59.

(MIRA 14 12)

(A) Gornyy Mountains - Uranium)
(A) Tai Mountains - Thorium)

VYSOKOOSTROVSKAYA, Ye.B.; OPARIN, O.M.

Distribution of uranium and thorium in the Kalguty granite massif
(Gornyy Altai). Inform.sbor. VSEGEI no.53:137-143 '62. (MIRA 17:1)

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APPROVED FOR RELEASE: Tuesday, August 01, 2000

CIA-RDP86-00513R0012381

OPARIN, P.G.

Setariosis of brain in sheep of the Maritime Territory. Soob. DVFAN
SSSR no.7:84-85 '55. (MLRA 10:4)
(Maritime Territory--Nematoda) (Sheep--Diseases and pests)
(Brain--Diseases)

~~BEGLIANOVA~~, M.I.; OPARIN, S.V. [deceased]

Some alkaloid-bearing plants of Krasnoyarsk Territory. Report
No.2. Uch. zap. Kras. gos. ped. inst. 15:117-127 '59. (MIRA 14:12.
(Krasnoyarsk Territory—Botany, Economic)
(Alkaloids)

OPARIN, V.

When wings grow. ... v. profsoinzy 20 no.1:32-33 Ja '64. (MIRA 17:2)

1. Predsedatel' ob"yedinennogo postroyechnogo k miteta stroitel'stva
Bratskoy elektrostantsii, Bratsk Irkutskoy oblasti.

28922
S/056/61/041/004/005/019
B108/B102

26.2340

AUTHORS: Afrosimov, V. V., Il'in, R. N., Oparin, V. A., Solov'yev, Ye. S., Fedorenko, N. V.

TITLE: Ionisation of argon by atoms and by singly and doubly charged ions of neon and argon

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 4(10), 1961, 1048-1055

TEXT: In order to study the effect of the charge of primary particles upon the total ionisation cross section, the authors examined ionization by collision with particles of 20 to 360 kev. Argon bombarded with Ar,

Ar⁺, Ar⁺⁺, Ne, Ne⁺, and Ne⁺⁺ was chosen for the experiments. The experimental arrangement is shown in Fig. 1. It is basically the same as that described in earlier publications (N. V. Fedorenko, ZhTF, 26, 1929, 1959 and 1941, 1956). Fast neutral atoms were obtained by resonance charge exchange of a monochromatic ion beam in chamber B. Ions that were left in the beam emerging from B, were eliminated by capacitor K. The total

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8/056/61/041/004/005/019
B108/B102

Ionization of argon by atoms and by ...

ionization cross section σ_- , the slow-ion production cross section σ_+ , and the production cross section σ_{on} for slow ions of charge n were measured. The random error was $\pm 12\%$ for work with fast ions, and $\pm 15\%$ for fast atoms. σ_- was found to increase monotonically with increasing particle velocity. The contribution of stripping to σ_- also increases with increasing particle velocity. Moreover, this contribution is the greater, the lower the charge of fast particles. Therefore, σ_- will be smaller for monoenergetic particles with a high charge than for monoenergetic particles with a small charge. As a general rule, it has been found that σ_- is greater for those fast particles which have more electrons in their sheath. These results are in accordance with those of other authors (I. P. Flaks. ZhTF, 31, 367, 1961). σ_{on} was found to rise with increasing charge of the bombarding ions. It is lowest for atom-atom collisions. This is caused by charge exchange and by ionization with capture, which predominate in atom-ion collisions. Professor V. M. Dukel'skiy is thanked for his interest, and I. T. Sheftel' for having supplied the resistance thermometers used in the

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28922

S/056/61/041/C04/005/019

B108/B102

Ionization of argon by atoms and by ...

collector. There are 10 figures and 14 references: 12 Soviet and 2 non-Soviet. The reference to the English-language publication reads as follows: H. B. Gilbody, J. B. Hasted. Proc. Roy. Soc., A240, 382, 1957. Mention is made of D. M. Kaminker (ZhTF, 25, 1843, 1955) and O. B. Firsov (ZhETF, 36, 1517, 1959).

ASSOCIATION: Leningradskiy fiziko-tekhnicheskii institut Akademii nauk SSSR (Leningrad Physicotechnical Institute of the Academy of Sciences USSR)

SUBMITTED: May 13, 1961

Legend to Fig. 1: - collision chamber, - measuring capacitor, A - mass analyzer for slow ions, - collector for fast particles; H_1 , H_2 , and H_3 are pumps evacuating the collision chamber to about $1 - 2 \cdot 10^{-6}$ mm Hg.

Card 3/4

S/056/62/042/003/004/049
B117/B112

24 672, 25 - 216

AUTHORS: Solov'yev, Ye. S., Il'in, R. N., Oparin, V. A.,
Fedorenko, N. V.

TITLE: Ionization of gases by fast hydrogen atoms and protons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,
no. 3, 1962, 659 - 668

TEXT: The ionization of H_2 , N_2 , He, Ne, Ar, and Kr by fast hydrogen atoms and protons of 10 - 180 kev was studied, and the ionization cross section, the stripping cross section for fast hydrogen atoms, and the production cross section for slow ions with various e/m ratios were systematically measured to obtain information on the ionization of inert gases and nitrogen. The measurements were made by the well-known condenser method which was supplemented by the mass analysis of the composition of slow ions. The experiments were carried out with a previously described device (Ref. 19: N. V. Fedorenko, V. V. Afrosimov, D. M. Kaminker, ZhTF, 26, 1929, 1956; Ref. 20: N. V. Fedorenko, V. V. Afrosimov, ZhTF, 26, 1941, 1956; Ref. 21: V. V. Afrosimov, R. N. Il'in, V. A. Oparin, Ye. S. Solov'yev, 26, 1941, 1956).

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S/056/62/042/003/004/049
B117/B112

Ionization of gases by fast...

N. V. Fedorenko, ZhETF, 41, 1048, 1961). Accidental errors did not exceed $\pm 15\%$, except the cross sections σ_{H^+} and $\sigma_{N^{2+}}$ ($\pm 30\%$). Theoretical and experimental data were comparable only to a limited extent. The stripping cross sections calculated in the Born approximation showed satisfactory agreement for energies above 60 keV. When the energies were lowered, the divergence between the relevant experimental and theoretical curves increased. Analysis of the experimentally obtained ionization cross sections proved the applicability of the Born approximation for the range of high velocities $v > v_0$. For the range of low velocities $v < v_0$, however, it could not be applied any more, since the cross sections for ionization by fast atoms were always a little greater than those for ionization by protons. In addition, the cross sections for ionization processes of the same kind increased with increasing target atom Z. The stripping curves of the fast atom (cross section σ_1) and the curves of the production of singly charged ions of inert gases (cross section σ_{01}) have shown that in most cases they reach maxima at velocities $v \geq v_0$. The peaks observed at

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B117/B112

Ionization of gases by fast...

lower velocities are qualitatively interpreted by a quasimolecular model, in which, owing to the drop of ionization potential, the peaks of the ionization cross sections are shifted toward lower velocities $v < v_0$, and where the ionization cross sections are interrelated by $\sigma(H)/\sigma(H^+) > 1$. From the point of view of the quasimolecular model, the proton-atom system of the inert gas seems more stable with regard to ionization than the H-atom-atom system of the inert gas. The probability that a particle will be ionized after the decay of the quasimolecule depends on the electron binding in the atom in question and on the ratio of statistical weights of possible states of charge. These two factors may effect a "competition" between the ionization processes, which must influence the position of the peaks of the ionization cross section. The curves for the production of singly charged ions of inert gases and for the stripping of the hydrogen atom confirmed the assumption that the position of the peaks depends not only on the ionization potential of the relevant atom but also on other factors. The maxima for velocities $v \sim (1 - 1.5)v_0$ were determined for cross sections $\sigma_1(H)$ and $\sigma_1(H^+)$ of ionization by atoms and protons, respectively. The experimentally obtained position of the peaks on the

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S/056/62/042/003/004/049
B117/B112

Ionization of gases by fast...

curves of cross sections for production of slow argon and krypton atoms is also given. It is noted that, as in the case of krypton, the peaks on the curves for two-electron and three-electron ionization ($\sigma_{02}(v)$, $\sigma_{03}(v)$) of argon correspond to about the same velocity $v_{\max} \sim v$. As in the case of interatomic collision, the position of the peaks is presumably determined by the ratio of the internal electron velocity of the second particle to the velocity of the relative motion. V. M. Dukel'skiy and O. B. Firsov are thanked for valuable hints. There are 7 figures and 23 references: 10 Soviet and 13 non-Soviet. The four most recent references to English-language publications read as follows: R. Curran, T. M. Donahue, Phys. Rev., 118, 1233, 1960; J. W. Hooper, E. M. McDaniel, D. W. Martin, D. S. Harmer, Phys. Rev., 121, 1123, 1961; J. W. Hooper, E. M. McDaniel, D. W. Martin, D. S. Harmer, Abstr. of the II Intern. Conf. Electronic and Atomic Collisions, Boulder, USA, 1961, p. 61 - 80; H. B. Gilbody, J. B. Hasted. Proc. Roy. Soc., A240, 382, 1957.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskii institut Akademii nauk SSSR
(Leningrad Physicotechnical Institute of the Academy of Sciences USSR) ✓

SUBMITTED: July 21, 1961
Card 4/4

SOLOVYEV, YE.S., IL'IN, R.M., OPARIN, V.A., FEDERENKO, N.V.

"Ionisation of gases by helium ions and fast helium atoms."

Report submitted to the Intl. Conf. on the Physics of Electronics
and Atomic Collisions. London, England 22-26 July 1963

SOLOV'YEV, Ye. S.; IL'IN, R. N.; OPARIN, V. A.; FEDORENKO, N. V.

Ionization of Gases by Fast Helium Atoms and Singly-Charged Helium Ions

report presented at the 11th Meeting of the Intl. Committee for Electrochemical Thermodynamics and Kinetics (CITRE) Moscow, 19-25 Aug 1963.

Ioffe Physico-Tech Inst. Acad. Sci. USSR, Leningrad USSR

SOLOV'YEV, Ye.S.; IL'IN, R.N.; OPARIN, V.A.; FEDORENKO, N.V.

Ionization of gases by fast atom and singly charged helium
ions. Zhur. eksp. i teor. fiz. 45 no.3:496-502 S '63.

(MIRA 16:10)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR.
(Ionization of gases) (Helium)

ACCESSION NR: AP4031139

S/0056/64/046/004/1208/1211

AUTHORS: Il'in, R. N.; Kikiani, B. I.; Oparin, V. A.; Solov'yev, Ye. S.; Fedorenko, N. V.

TITLE: Dissociation of positive hydrogen ions in collisions with atoms and gas molecules

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1208-1211

TOPIC TAGS: proton cross section, hydrogen, nitrogen, helium, argon, particle collision, ionization phenomena

ABSTRACT: The purpose of the work was to repeat the measurements of the cross section for the production of protons following dissociation of molecular ions H_2^+ with energy 10--180 keV in hydrogen, nitrogen, helium, and argon, using the same setup as previously (ZhETF v. 36, 385, 1959), but with a more thorough elimination of the main sources of the systematic errors. Comparison of the data obtained

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ACCESSION NR: AP4031139

on these cross sections with the work published by others shows that over a wide energy range the majority of the curves obtained in recent work lies between the data of Sweetman (Proc. Roy. Soc. v. A256, 416, 1960 and private communication) and the early work by the authors, with the exception of the early data by C. F. Barnett (Second UN Intern. Conf. on Peaceful Uses of Atomic Energy, Geneva, 1958, Report 1789) which lie considerably below. Taken together, the various data cover almost the whole range of kiloelectron volt energies. For hydrogen, the maxima discovered and reported in the early work are confirmed, the first being due to the predominant contribution of the dissociation of H_2^+ ions into atoms and protons, and the second being related to the dissociation into two protons. A separate measurement of these two cross sections by J. Guidino (C. R. Paris, v. 253, 829, 1961) confirms these results. Orig. art. has: 4 figures and 1 formula.

Card 2/3

ACCESSION NR: AP4031139

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR
(Physicotechnical Institute AN SSSR)

SUBMITTED: 18Oct63

DATE ACQ: 07May64

ENCL: 00

SUB CODE: NP, GP

NR REF SOV: 005

OTHER: 006

Card 3/3

L 13651-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2
P1-1/Po-1/Pz-8/Pab-10 IJP(c)/ESD(t) AT

ACCESSION NR: AP4047890

S/0056/64/047/004/1235/1242

AUTHORS: Il'in, R. N.; Kikiani, B. I.; Oparin, V. A.; Solov'yev,
Ye. S.; Fedorenko, N. V.

TITLE: Formation of highly excited hydrogen atoms in proton charge exchange in gases

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47,
no. 4, 1964, 1235-1242

TOPIC TAGS: hydrogen, charge exchange, excited state, proton inter-
action

ABSTRACT: The purpose of the work was to study the efficiency of
proton charge exchange in highly excited states of H in molecular
gases, for which there are practically no data. The hydrogen atoms
had principal quantum numbers $n \geq 8$, the proton energies were 16--
180 keV, and the molecular gases investigated were H₂, N₂, and CO₂.

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L 13651-65

ACCESSION NR: AP4047890

The method used to measure the relative number of highly excited atoms in an atomic beam, using dissociating electric fields, was suggested by A. C. Riviere and D. R. Sweetman (Nucl. Fusion Suppl. 1962, Part 1, p. 279; Phys. Rev. Lett. v. 5, 560, 1960). The experimental setup is shown in Fig. 1 of the enclosure. The integral dependence of the proton current $I(E)$ was measured under single-collision conditions, and was found to be the same, within 15%, for all gases except molecular hydrogen, which gave values of I about 30% higher than nitrogen and carbon dioxide. The differential dependence dI/dE was also measured, and the results used to determine the relative population of the states. To determine the number of highly excited hydrogen atoms compared with the primary proton beam, the variation of the relative yield with the thickness of the gas target was also studied and was found to increase with increasing target thickness up to 0.1 torr-cm, at which a charge equilibrium was established in the beam. The relative yield of highly excited atoms was determined by ionizing them in a strong electric field (the

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L 13651-65

ACCESSION NR: AP4047890

6

Lorentz ionization). An estimate of the cross sections for the capture into the state with $n = 10$ gave values of 10^{-19} -- 10^{-20} cm² for the investigated cases. Some depletion of the highly excited states was observed with increase of target thickness in the yield of highly excited atoms relative to the atomic beam. "The authors thank N. N. Lebedev and I. P. Skal'skaya for calculating the fields in the gap, and I. F. Kalinkevich, I. T. Serenkov, and V. V. Bagayev for development of the electronic equipment." Orig. art. has: 5 figures, 3 formulas, and 2 tables.

ASSOCIATION: Fiziko-tehnicheskii institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 07May64

ENCL: 01

SUB CODE: NP

NR REF SOV: 007

OTHER: 007

Card 3/4

L 13651-55

ACCESSION NR: AP4047890

ENCLOSURE: 01

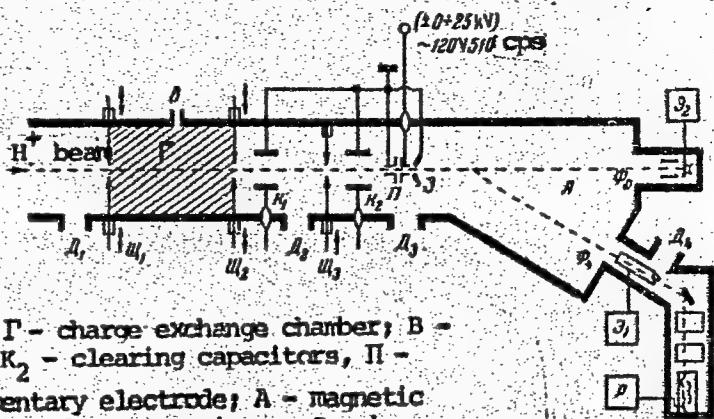


Fig. 1. Diagram of setup: Γ - charge exchange chamber; B - gas inlet to chamber; K_1, K_2 - clearing capacitors, Π - breakdown gap; Z - supplementary electrode; A - magnetic analyzer; Φ_+, Φ_0 - proton and atom receivers; C - ion counters; E_1, E_2 - electrometers; P - phase sensitive recording circuit; M_1, M_2, M_3 - collimating slits; II - vacuum pumps

Card 4/4

9813-66 EWT(m)/T/EWP(t)/EWP(b)/EWA(m)-2 IJP(c) JD/JG

ACC NR: AP5027990

SOURCE CODE: UR/0386/65/002/007/0310/0314

AUTHOR: Il'in, R. M.; Oparin, V. A.; Solov'yev, Ye. S.; Fedorenko, N. V.

ORG: Physicotechnical Institute im. A. F. Ioffe Academy of Sciences SSSR (Fiziko-
tekhnicheskiy institut Akademii nauk SSSR)

TITLE: Charge exchange of protons in alkaline metal vapor with formation of highly
excited hydrogen atoms

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu.
(Prilozheniye), v. 2, no. 7, 1965, 310-314

TOPIC TAGS: proton, charge exchange, alkali metal, hydrogen, excited state

ABSTRACT: The charge exchange of 10--180 kev protons in vapor of Li, Na, K, Cs, and Mg was investigated with an aim at using this process to obtain highly excited hydrogen atoms. An atomic beam, obtained by charge exchange of the protons in the vapor of these metals and purified to eliminate the charged particles, was fed into a region with strong electric field, of intensity $E < 160$ kv/cm. The ratio of the current of the secondary protons, produced upon ionization of the highly excited atoms in the field E , to the total current of the atoms $I(E)$ was measured. This ratio characterizes the relative charge-exchange yield of the highly excited atoms. The total cross section for proton charge exchange and the ratio of the total number of atoms produced by charge exchange to the number of protons in the primary beam were also measured in individual experiments. These made it possible in turn to determine the cross section for the charge exchange accompanied by production of highly excited

Cord 1/2

L 9813-66

ACC NR: AP5027990

atoms. Plots of the cross sections against proton energy are presented both for metallic targets and (for comparison) for He, Ne, Ar, and H₂. The plots show that the cross sections for alkaline metals and for magnesium above 15 kev decrease with increasing energy. A characteristic kink was observed for both cross sections in the region 30--70 kev, beyond which the decrease of the cross sections slows down. The presence of the kink on the curves can be attributed to the fact that at low energies the outer weakly-bound electron of the metal atom takes part in the charge exchange, while at high energies a greater role is played by charge exchange with participation of the electrons from the filled shell, analogous to the outer shell of an inert gas. The latter is confirmed by the similarity of the plots for the alkaline metals and magnesium and the similar plots for inert gases at high energies. The main conclusion of the investigation is that vapors of alkaline and alkali-earth metals are more suitable targets for the production of highly excited atoms of hydrogen at energies below 50 kev, and that molecular hydrogen and inert gases are preferable at higher energies. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 002/ OTH REF: 002

Card 2/2

L 02273-67 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) JD/WW/JG/AT

ACC NR: AP6025252

SOURCE CODE: UR/0057/66/036/007/1241/1250

AUTHOR: Il'in, R.N.; Oparin, V.A.; Solov'yev, Ye.S.; Fedorenko, N.V.

ORG: Physicotechnical Institute im. A.F. Ioffe, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut)

TITLE: Electron attachment to protons in alkali metal vapors with the formation of highly excited hydrogen atoms

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 7, 1241-1250

TOPIC TAGS: proton, charge exchange, gas target, atom, excited state, alkali metal, inert gas, hydrogen, carbon dioxide, plasma injection,

ABSTRACT: The authors have measured the cross sections of Li, Na, K, Cs, He, Ne, Ar, and H₂ for the electron attachment reaction of 10 to 180 keV protons with particular attention to the cross sections for production of highly excited hydrogen atoms. The measurements were undertaken because of their interest in connection with injection of plasma into magnetic traps. The beam, initially of protons, successively traversed the 12 cm long heated target chamber, a weak transverse electric field which removed the charged particles, a strong (up to 160 kV/cm) electric field which ionized the highly excited atoms, and a magnetic field which separated the ions from the remaining neutral atoms. The neutral atoms were recorded with a secondary emission detector

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UDC: 539.186

L 02273-67

ACC NR: AP6025252

which was calibrated against a calorimeter. The alkali metals were introduced directly into the target chamber, and the pressure of the vapor target was determined from the temperature of the chamber. Thin target data were obtained for all the target materials, and thick target (up to 0.4 cm torr) data were obtained for Na and Ne and, at some values of the incident proton energy, for K, Cs, and CO₂. The results are presented graphically and in tabular form; they are discussed at some length and are compared with theoretical calculations and with data of other investigators. It is concluded that at incident proton energies up to 30 keV the alkali metal vapors are efficient targets for producing both highly excited and moderately or unexcited hydrogen atoms, but that at higher proton energies the inert gas and H₂ targets are more effective for producing highly excited atoms. The authors thank Yu.N. Demkov for discussing the results. Orig. art. has: 7 formulas, 7 figures, and 3 tables.

SUB CODE: 20

SUBM DATE: 05Aug65

ORIG. REF: 006

OTH REF: 013

Card 2/2 vmb

OPARIN, Vyacheslav Grigor'yevich; SOZONOV, S.G., red.; SHEVCHENKO, L.V.,
tekhn. red.

[One against six] Odin protiv shesti. Petrozavods, Gos. izd-vo
Karel'skoi ASSR, 1961. 50 p. (MIRA 14:8)
(Petrov, Petr Mikhailovich, d.1942)

ACC NR: AF7001401

(N)

SOURCE CODE: UR/0413/66/000/21/0077/0077

INVENTORS: Alekseyenko, A. V.; Berlin, V. M.; Krasov, P. A.; Litvinov, V. I.;
Shelkov, V. V.; Oparin, V. I.; Hemesnikov, A. I.; Stepanov, S. N.

ORG: none

TITLE: An assembly for welding internal joints of boiler shells. Class 21, No.
167906 [announced by All-Union Scientific Research and Design Engineering Institute
of Chemical and Petroleum Apparatus Construction (Vsesoyuznyy nauchno-issledovatel'skiy
i proyektnyy institut tekhnologii khimicheskogo i neftyanogo apparatostroyeniya)]

SOURCE: Izobreteniya, promyshlennyye obraztzy, tovarnyye znaki, no. 21, 1966, 77

TOPIC TAGS: welding, welding equipment, welding technology, seam welder.

ABSTRACT: This Author Certificate presents an assembly for welding internal joints
of boiler shells. The assembly consists of a column with a frame mounted upon it.
The frame carries an arm with a welding head placed on supporting rollers. To
maintain a constant position of the electrode in respect to the seam surface, the
welding head and arm are connected to one another by a hinge and a spring (see Fig. 1).
The latter assures a constant contact between the rollers and the boiler shell. The
welding head is hinged to the bearing rollers which are rigidly connected to one
another.

Card 1/2

UDC: 621.791.037-477

ACC NR: AP7001401

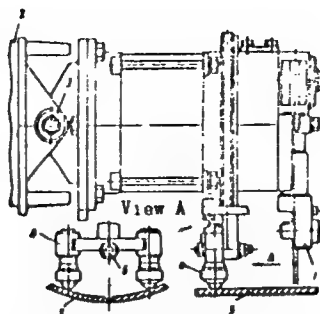


Fig. 1. 1 - welding head; 2 - arm; 3 - arm hinge; 4 - bearing rollers; 5 - boiler shell; 6 - hinge

Orig. art. has: 1 figure.

SUB CODE: 13/ SUBM DATE: 11Oct65

Card 2/2

OPARIN, Ye.I.

Rebuilding the apron part of old Ural spillways under the
cover of an existing shielding well. Vop. vod. khoz. 1
gidrol. Urala no.2:13-21 '63. (MIRA 18.5)

On ARIN, Ye.I.

Efficiently protecting for rebuilding old Ural dams. Top. 40.
khov. 1 gidrol. Urala no.2/4" 51 '63. (MIRA 18)

OPARIN, Ye.L.; KHROMOVA, A.P.

Specialists joined the brigades. Mashinostroitel' no.6:2-3
Je '64. (MIRA 17:8)

S/120/63/000/001/003/072
E032/E314

AUTHORS: D'yachkov, B.A. and Oparin, Ye.M.

TITLE: A low-voltage generator of monochromatic neutrons

PERIODICAL: Priory i tekhnika eksperimenta, no. 1, 1963,
23 - 26

TEXT: A low-voltage neutron generator is described, capable of producing monochromatic neutron fluxes of 3×10^9 sec⁻¹ at 2.5 MeV and 10^{11} - 2×10^{11} sec⁻¹ at 14 MeV. The accelerating tube provides a deuteron beam (200 keV, 5 mA). The ion source is similar to that described by Eubank et al (Rev. Scient. Instr. **25**, 1954, 25, 989). A sectional drawing of the tube is shown in Fig. 1 (1 - focusing lens and ion source, 2-3 - accelerating section, 4 - electrostatic screen, 5-6 - permanent magnets, 7 - magnetic analyzer chamber, 8 - water-cooled copper screen with tungsten diaphragms and 9 - zirconium target saturated with deuterium or tritium and used for the $D(t,n)He$ and $D(d,n)He$ reactions. The basic circuit of the stabilized EHT unit is reproduced. It is in the form of a voltage multiplier fed from Card 1/3

A low-voltage generator

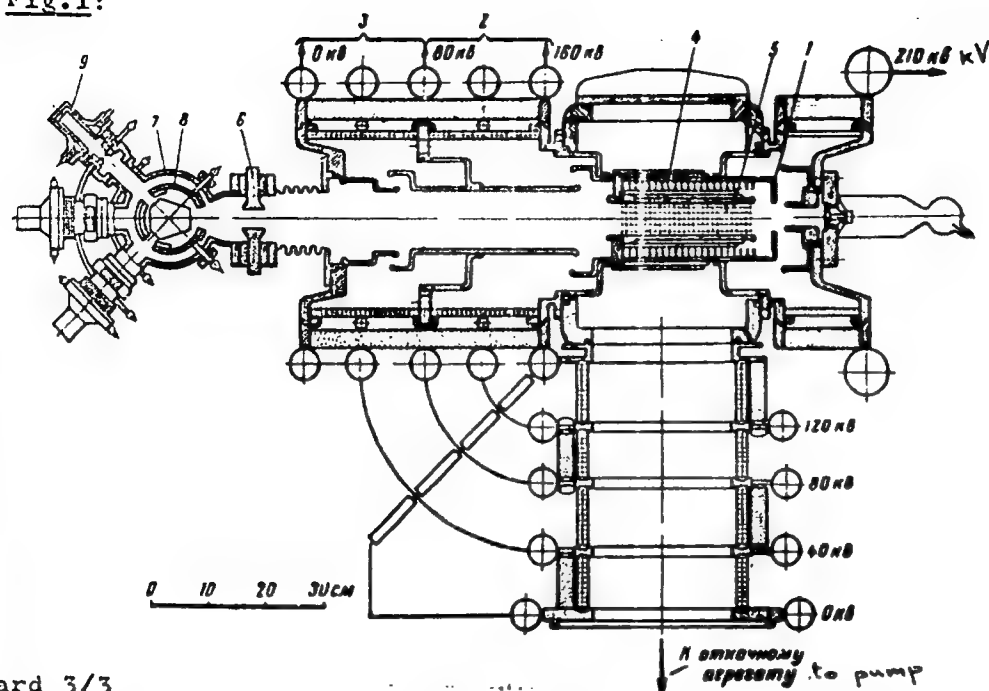
S/120/63/000/001/003/072
E032/E314

a 2.5 kc/s vacuum-tube oscillator. The maximum output is 50 kV at 20 mA. A $\pm 0.15\%$ stabilization over 6 hours is ensured. The neutron generator has been in use since 1958. There are 3 figures.

SUBMITTED: April 26, 1962

Card 2/3

Fig.1:



A low-voltage...
S/120/63/000/001/003/072
E032/E314

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ACCESSION NR: AP4000438

S/0089/63/015/005/0411/0413

AUTHOR: Oparin, Ye. M.; Saukov, A. I.; Shuvalov, R. S.

TITLE: Inelastic scattering of neutrons with an energy of 14 Mev by light nuclei

SOURCE: Atomnaya energiya, v. 15, no. 5, 1963, 411-413

TOPIC TAGS: inelastic neutron scattering, fast neutron spectrum, light nucleus, neutron passage, beryllium, lithium, boron, carbon, nitrogen, oxygen, time of flight technique, plastic scintillator, neutron cross section, reactor shielding, radiation shielding, neutron, scintillation counter, neutron passage through beryllium, neutron passage through lithium, neutron passage through boron, neutron passage through carbon, neutron passage through nitrogen, neutron passage through oxygen

ABSTRACT: The spectra of inelastically scattered neutrons for lithium, beryllium, boron, carbon, nitrogen, and oxygen at the incident neutron energy of 14 Mev were investigated with the time-of-flight method (see Fig. 1 of Enclosure). A plastic scintillator, measuring

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ACCESSION NR: AP4000438

100 mm both in height and in diameter, with a FEU-36 photomultiplier served as the neutron detector. The resolving time of the equipment (2τ), measured by the gamma peak, is equal to 3.5×10^{-9} sec. During neutron recording, this time increased to 5.4×10^{-9} sec. Specimens of the following compounds measuring 60 x 100 x 100 mm were investigated: lithium hydride (LiH), beryllium, carbon (graphite), boron carbide (B_4C), melamine ($C_6H_6N_6$), and water. Since the measurements were carried out at an angle of 90° to the initial neutron beam, the presence of hydrogen in the investigated compounds had no significant effect on the measurement results. Because of the insufficient resolving power of the measuring equipment, the discrimination between peaks of elastically and inelastically scattered neutrons was obtained using additional data from "Nuclear Physics," V, 11 (1959). Solid lines in graphs a and b of Fig. 1 represent the spectra of inelastically scattered neutrons calculated from Maxwellian distribution at the temperature $T = 2E_{av}$. The data obtained may be useful in calculations of neutron passage through thick layers of materials. Orig. art. has: 2 figures, 1 table, and 1 formula.

Card 2/6

OPARIN, Ye.P., inzh.; KOROSTELEV, V.P., inzh.

New salary system for track maintenance workers. Zhel. dor. transp.
40 no.8:52-54 Ag '58. (MIRA 11:9)
(Railroads, Salaries, pensions, etc.)

OPARIN, Ye.P., inzh.

Economically feasible uses of railroads and pipelines for
petroleum transportation. Trudy TSHII MPS no.162:146-207
'58. (MIRA 12:4)
(Petroleum--Transportation)

OPARIN, Ye.P.

Comparison of labor productivity standards on the railroads of the
U.S.S.R. and U.S.A. Zhel.dor.transp. 46 no.3:24-30 Mr '64.
(MIRA 17:3)

GORBUNOV, V.F.; BABUROV, V.I.; OPARIN, Yu.A.; REDUTINSKIY, L.S.

Raising the efficiency of fettling operations. Lit. proizv. no. 9:
13-15 S '64. (MIRA 18:10)

AUTHORS:

Опарина, А. Ф., Домбровская, Н. С.

78-2-23/43

TITLE:

The Mutual System of the Thiocyanates and Chlorides of Sodium and Potassium (Vzaimnaya sistema iz rodanidov i khloridov natriya i kaliya).

PERIODICAL:

Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 2, pp. 413-424 (USSR).

ABSTRACT:

The mutual system Na, KCl, CNS was investigated with the employment of methods such as the determination melting point, thermographic investigations, microstructure and X-ray analysis. On the basis of the thermographic and crystallization investigations the following compounds were determined: 1. NaCNS 2. KCNS 3. Uninterruptedly solid solutions of (Na,K) Cl. In this system two eutectic points were determined at 126° C with a composition of 1,8% NaCl, 26,5% NaCNS and 71,7% KCNS and at 152° C with a composition of 4,25 NaCl, 13,5% NaCNS and 82,25% KCNS. A microphotography of potassium- and sodium-thiocyanate was taken of the different phases of the system Na, KCl, CNS. At 145° C potassium thiocyanate undergoes a polymorphous transformation which mainly spreads at the edges of the crystal. This transformation was also followed by micro-

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The Mutual System of the Thiocyanates and Chlorides of
Sodium and Potassium.

78-2-23/43

photography with double and triple salt-melts with the participation of potassium thiocyanate. The microphotographic results are in agreement with the results of the polythermal methods. Radiographs for potassium thiocyanate and sodium thiocyanate as well as the melt of the mutual system Na, K|Cl, CNS were also produced. There are 15 figures, 6 tables, and 8 references, 8 of which are Slavic.

SUBMITTED: March, 19, 1957

AVAILABLE: Library of Congress

Card 2/2

OPARINA, A.F.; DOMBROVSKAYA, N.S.

Ternary reciprocal system consisting of bromides and nitrates of
lithium and sodium. Zhur.neorg.khim. 6 no.10:2364-2370 1961.
(MIRA 14:9)

(Systems (Chemistry))

ACC NR: AT6036629

SOURCE CODE: UR/0000/66/000/000/0331/0332

AUTHOR: Ryzhov, N. I.; Derbeneva, N. N.; Seraya, V. M.; Mashinskaya, T. Ye.;
Oparina, D. Ya.; Govoruk, R. D.

ORG: none

TITLE: Relative biological effectiveness of 126-Mev protons in repeated exposures
imitating the frequency of solar flares [Paper presented at the Conference on Problems
of Space medicine held in Moscow from 24-27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy
kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii,
Moscow, 1966, 331-332

TOPIC TAGS: cosmic radiation biologic effect, proton radiation biologic effect,
radiation hematologic effect

ABSTRACT:

A study was made of the RBE of protons during repeated exposures
approximating the frequency of solar flares in years of maximum solar
activity. Half of the test group of 360 Wistar rats were irradiated with

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ACC NR: AT6036629

126-Mev protons, and the other half with 180-kv x-rays in single doses of 25, 50, 100, 200, and 400 rad. In the course of a year the animals received nine-fold exposure, amounting to total doses of 225, 450, 900, 1800, and 3600 rad, respectively. The dose power of proton radiation was 24-48 rad/min, and of x-ray radiation, 36 rad/min. It was found that nine-fold irradiation with protons and x-rays caused radiation sickness, the severity of which depended on the magnitude of single and total doses.

Definite differences were observed between the effects of protons and x-rays: protons caused greater depression of leukocytosis, and also further retarded the rate of recovery processes. Observed changes in the leukocyte count basically depended on corresponding shifts in the lymphocyte count. The content of neutrophils and other blood elements changed less under the influence of both types of radiation. Repeated irradiation with protons and x-rays caused progressive decrease in erythrocyte and hemoglobin content; the degree of decrease (which was slightly less pronounced for proton irradiation) depended directly on the magnitude of single and total doses. Changes in reticulocyte and thrombocyte content were less regular, and no reliable difference in the effects of protons and x-rays on these elements could be established. In many cases the formation of malignant tumors was a remote aftereffect of irradiation. Irradiation in a total dose of 3600 rad caused 100% death of rats with both x-ray and

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ACC NR: AT6036629

proton irradiation: the average time of life was 236 and 247 days, respectively. It was concluded that the RBE of 126-Mev protons does not differ essentially from 180-kv x-rays, and thus equals 1.0 under the given conditions.

[W. A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 3/3

ACC NR: AT6036635

SOURCE CODE: UR/0000/66/000/000/0340/0341

AUTHOR: Seraya, V. M.; Ryzhov, N. I.; Derbeneva, N. N.; Mashinskaya, T. Ye.;
Oparina, D. Ya.; Sychkov, M. A.

ORG: none

TITLE: ⁶⁰Changes in the hematopoietic system of rats irradiated with 126-Mev protons
and Co gamma rays [Paper presented at the Conference on Problems of Space
Medicine held in Moscow from 24-27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy
kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii,
Moscow, 1966, 340-341

TOPIC TAGS: proton radiation biologic effect, ionizing radiation biologic effect,
relative biologic efficiency, hematopoiesis, bone marrow, radiation tissue effect

ABSTRACT:

The comparative effect of single whole-body irradiation with 126-Mev
protons and Co⁶⁰ gamma rays on the cellular composition of peripheral
blood, bone marrow, and spleen was studied using 618 male rats. Animals

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ACC NR: AT6036635

were irradiated with 126-Mev protons from an OIYAI synchrocyclotron in doses of 100, 200, 400, 550, 700, and 1000 rad, and with the same doses of gamma rays from an EGO-2 apparatus. The dose power of protons was 0.57 rad/sec and of gamma rays, 3.1 rad/sec.

The following indices of hemodynamic change were used: total number of leukocytes, absolute number of neutrophils and lymphocytes, absolute number of karyocytes (normoblasts), and impressions of femoral bone marrow. Tests were conducted 1, 3, 6, and 12 hr, and 1, 2, 4, 7, 12, 20, and 30 days after irradiation.

Identical processes of disruption of hematopoiesis were observed under the influence of both protons and gamma rays. Change in the number of leukocytes and the number of nucleated bone-marrow cells in the first hours and days after irradiation had a phase character. During the first phase, the bone-marrow cell level was maintained near the normal level. In this period a considerable increase in the number of leukocytes in the peripheral blood was observed and neutrophilia developed. These phenomena may be connected with reflex reaction to irradiation and with redistribution of blood.

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The duration of leukocytosis and the degree of its development depended on the radiation dose. The second phase of postradiation change was characterized by disintegration of young bone-marrow cell elements and by disintegration of lymphocytes. Considerable decrease in the number of bone-marrow cells occurred in this period. The number of leukocytes was close to normal with doses of 700 and 1000 rad and somewhat lower with doses up to 400 rad.

In the third phase of change in blood indices, total depression of hematopoiesis was observed, as shown by the considerable decrease in number of bone-marrow cells and leukocytes in the peripheral blood. Maximum decrease in the number of nucleated cells occurred two days after irradiation with doses of 100, 200, and 400 rad. However, with proton irradiation in doses of 700 and 1000 rad, decrease in the number of nucleated bone marrow cells was less pronounced. The maximum decrease in leukocyte content was noted on the fourth day: it was considerable for gamma rays and dose-dependent for both types of irradiation.

A period of relative stabilization followed at the end of the third phase. With radiation doses of 100, 200, and 400 rad the number of bone-marrow cells in this period was close to normal or slightly higher. There was no

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abrupt increase in the number of bone-marrow cells (period of abortive increase). The greater the dose, the less pronounced this abortive phase. The number of leukocytes normalized by the end of this period. The period of abortive increase in bone-marrow cells preceded the period of final normalization with doses of 100, 200, and 400 rad.

Comparing functional changes in rat hematopoiesis during proton and gamma irradiation revealed the same pattern of processes, although the degree of manifestation of phenomena and the sequence of their occurrence were somewhat different. With large radiation doses (700—1000 rad), processes of bone-marrow destruction were more intensive during gamma irradiation; the RBE of protons in this case was less than one. However, with proton doses of 100, 200, and 400 rad, RBE values with respect to the number of nucleated bone-marrow cells was close to one.

[W. A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 4/4

SHAFR, V.Z., PRYVALOV, A.M., GORILKO, A.K.; BELYKH, V.I., BYCHKOVA,
M.I., KRYVONOS, A.M.; YAKUBENOK, V.I.

Products of the reaction of formaldehyde and isocyanate via
dimethylol, substituted. Izv. AN SSSR, Ser. Khim. No. 4, 1963,
265-268. (MIRA 12:1)

1. Analizirovaniye khimicheskikh soedineniy v laboratorii
Giydrokharakterizatsii vyuro shtatov Priiskogo
soveta narodnogo khozyaystva, 1963.

Preparation of 3,5-dimethylpyridine and 2,3,5-trimethylpyridine. M. P. OBARINA
J. Russ. Phys. Chem. Soc. 61, 3001-10(1928) —In the condensation of EtCHO (I) with
 NH_3 , in the presence of AlCl_3 , there is obtained a little of 3,5-Me₂C₅H₃N (II) as by
product, which is possibly produced by condensation of NH_3 with 2 mols of I and 1 mol
of HCHO , which is formed from I at the high temp. This is confirmed by formation
of HCHO , which is formed from 3 mols of I with 1 mol of HCH(OH)(OH) (III).
II as a main product in the interaction of 3 mols of I with 1 mol of HCH(OH)(OH) .
III produces as by products $\text{C}_5\text{H}_7\text{N}$ and a picrate
whereby the mother liquor from the picrate of 3,4-Me₂C₅H₃N and a picrate
of 6-picoline, a picrate m 162.3° (possibly the picrate of the contamination of
δ-picoline, a picrate m 183° proved to be identical with the picrate obtained from
m 183°. The formation of $\text{C}_5\text{H}_7\text{N}$ proved to be identical with the picrate obtained from
I with AcCl . The picrate m 183° came out, and with that of 2,3,5-Me₃C₅H₂N (IV), which was
the base of the low temp. coal tar, and with that of 2,3,5-Me₃C₅H₂N (IV), which was
prepared by condensation of 2 mols. of I and 1 mol of AcCl with NH_3 . IV was also prepd.
by the action of MeI on II, which when oxidized gives the 2,3,5-(CO)₂(H)₂ acid, while
by the action of MeI on II, which when oxidized gives the 2,3,5-Me₃C₅(CO)₂(H)₂N,
incomplete oxidation produces 2 acids, $\text{Ca}(\text{OH})_2$, 2,5-Me₂C₅H₃N, while the other acid is
m 183.6°, and gives on distn with $\text{Ca}(\text{OH})_2$, 2,3,5 Me₃C₅H₂N (Higuchi, C A 33, 391) *Exptl part* The condensation of I
with III and NH_3 , in the presence of AlCl_3 . A mixt of 340 g of I and 300 g of III is
dropped slowly at 330-40° through a Cu tube filled with AlCl_3 in a current of NH_3 .
The reaction product is treated with HCl to eat the base, these are set free with alkalis,
distd., and each fraction is subjected to fractional pptn with picric acid in alc, giving in
all 14% of II, some picoline and $\text{C}_5\text{H}_7\text{N}$. When working with 200 g of I and 190 g of
III at 365-75° there is obtained 16% of II, while at 340-80° with 295 g of I and 254 g

on redist. gave no sharply defined fractions. The formation of Et_2Si , $\text{iso BuEt}_2\text{Si}$ and $\text{iso BuEt}_2\text{Si}$ is accepted. *Rearrangement of iso AmEt}_2\text{Si} - $\text{iso AmEt}_2\text{Si}$, b. 201-5.5 obtained from iso AmSiCl_3 and EtMgBr in Et_2O , was heated 48 hrs. at 300 in H_2 at 100 atm. The gaseous portion contained some C_4H_{10} hydrocarbons. The oil on re-distn. gave several fractions, of which were identified $\text{iso C}_4\text{H}_{10}$, Et_2Si , b. 153-6, $\text{iso AmEt}_2\text{Si}$, Et_2Si . The reaction is formulated $2 \text{ iso AmEt}_2\text{Si} \rightarrow \text{iso AmEt}_2\text{Si} + \text{Et}_2\text{Si}$ and $2 \text{ iso AmEt}_2\text{Si} + \text{H}_2 \rightarrow 2 \text{ C}_4\text{H}_{10} + \text{Et}_2\text{Si}$. CHAS. BRACE*

10

CA

100 AND 1000 CODES

PROCESS AND PROPERTIES INDEX

2-Methyl-5-isopropylpyridine. M. P. Oranina. *J. Russ. Phys.-Chem. Soc.* 61, 2011 (1929). 2-Methyl-5-isopropylpyridine (I) was synthesized from 2-methyl-5-acetylpyridine (II) obtained from 3-methylpyridine-5-carboxylate (III), each of which gives with MeMgI (Chichibabin, *Ibid.* 36, 1106(1908). Subsequently, C. A. 3, 841) the same 2-methylpyridine-5-dimethylcarbamate (IV), which on reduction with III gives I. II was converted to the picrate which, recrystd. from alc., m. 101.2°, the recovered free ketone b. 230-31°, 9 g. of which in Et₂O was added to ice-cold MeMgI (3 mols.) after 12 hrs the reaction mixt., treated with K₂CO₃, exhd. with H₂O, yielded 9 g. of IV, b. 138-40°, recrystd. from petroleum ether it m. 61.2°. I was prepd. in 3 g. yield by heating III in a mixt. of 8.5 g. of IV, 40 g. of III, b. 127°, and 1 g. of red P., to the nitrate was gradually added Zn dust, decoupled with K₂CO₃, exhd. with H₂O, distd., b. 73-4°, converted to the picrate, m. 106.7°, the recovered base b. 100.01°, d₄ 0.9237, d₂₀ 0.9114, the aurate m. 93-4°, the chloroplatinate with 1 mol. of H₂O m. 93-4°, anhyd. m. 137.8°. I was also obtained by refluxing 4 hrs 7 g. of III with 2 parts of alc. and H₂SO₄, yield 4.3 g., b. 120-7°, thus prepd., the ester was dropped into 3 mols. of MeMgI, decoupled with K₂CO₃, the IV exhd. with H₂O, distd. in vacuo, m. 60.7°, 2.2 g. of IV reduced with III as described above give 1.6 g. of I, the picrate of which m. 107.8°, and the recovered base d₄ 0.9225, d₂₀ 0.9008, the chloroplatinate m. as above.

CHAS. BLANC

ASD 11.4 METALLURGICAL LITERATURE CLASSIFICATION

1000-10000

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PROCESSES AND PROPERTIES INDEX

10

The volatile base of valerian roots. A. B. Chichibabin and M. P. Oparina. *Compt. rend. acad. sci. U. R. S. S.* [N. S.], 3, 119-20 (in English 121-2) (1964).—Dry valerian roots (2 kg.) were treated with HCl, steam-distilled with soda, acidified and extd. with ether; the acid portion was made alk., extd. with ether, dissolved in alc and picric acid added. Recrystn. from hot alc. gave 0.84 g. picrate, $C_{17}H_{19}N \cdot C_6H_3(NO_2)_3OH$. The free base with HCl and $HgPrCl_2$ gave the chloroplatinate ($C_{17}H_{19}N \cdot HCl$). PtCl₂. The free base is a colorless oil at 0°, insol. in H₂O, has a pyridine homolog odor, gives ppt. with HgCl₂, or I₂ in KI and slowly reacts with KMnO₄.

F. H. Rathmann

[illegible]

Ca

17

Preparation of apomorphine. M. P. Churina, A. B. Karasina and B. Smirnov *Khim. Farm. Prom.* 1936, No. 5, 18-19. A marked improvement over the HCl autoclave method is to heat morphine in an open vessel with H_3PO_4 and pass HCl gas through the mixt. The yield of apomorphine-HCl is about 42%. I. N.

AND SEA METALLURGICAL LITERATURE CLASSIFICATION

17

CH

COMMON ELEMENTS

1ST AND 2ND COLS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH COLS

APOMORPHINE. M. P. Oparina, A. S. Karasina and H. P. Smirnov. Russ. 40,081, Jan. 31, 1935. Morphine is heated with H_2PO_4 to $145-50^\circ$ and gaseous HCl is passed simultaneously through the soln. The mixt. is cooled, the resins salted out by introducing first $NaCl$ and then Na_2CO_3 till the creation of the pptn. of residues, the soln. evapd., the ppt. dissolved in water and neutralized the soln. with sulfite to a complete pptn. of the apomorphine, and this is extd. with ether.

ASB SLA METALLURGICAL LITERATURE CLASSIFICATION

62

1st and 2nd copies										3rd and 4th copies									
PROCESSES AND PROPERTIES INDEX																			
10																			
Pyridyl-2-acetic acid and pyridyl-2,6-diacetic acid M. P. Opatina. J. Gen. Chem. (U. S. S. R.) 5, 1000- 1711 (1935). See C. A. 29, 1820 G G																			
ASB-51A METALLURGICAL LITERATURE CLASSIFICATION																			
GROUPS										SUBGROUPS									
1 2 3 4 5 6 7 8 9 10										11 12 13 14 15 16 17 18 19 20									

Preparation of 2,6-dimethylpyridine. M. P. Oparina, A. B. Karasina and B. P. Smirnov. *J. Applied Chem.* (U. S. S. R.) 11, 985 (in French 960) (1938). -- Dihydro-lutidinecarboxylic ester (1 kg.) was added in small portions (10-20 g.) to 1.4 l. of HNO_3 (d. 1.4) while thoroughly mixing and cooling with a snow-NaCl mixt. At the moment of addn., the temp. rises to 20-25°, and the new portion should be added only after the temp. drops to 10°. After the total amt. was added the mixt. was stirred until a sample dild. with water gave a transparent soln., then it was dild. with an equal vol. of water, neutralized first with 40% NaOH (500-600 cc.) followed with solid Na_2CO_3 to alk. reaction. The pptd. lutidinecarboxylic ester was filtered out, washed with water until neutral and dried at 40-50°. The yield of ester (m. 72°) was 95%. The ester (1 kg.) obtained was added (within 15 min.) to a mixt. of KOH 540 g., alc. 280 cc. and water 300 cc. The solid mixt. formed was warmed up on a bath and the alc. was steam-distd. The residue (2.5-2.8 l.) was K lutidinecarboxylate soln. A portion of this soln. (500-60 cc.) was mixed with 400 g. CaO , packed uniformly on the bottom of an iron retort and covered with a layer (0.5 mm.) of slaked lime. The retort with its contents was rapidly heated on a strong flame to redness (any delay in heating decreased the yield). Water distd. first, followed by an

emulsion of dimethylpyridine in water, then the main mass of dimethylpyridine followed, next an emulsion again and finally water. The whole distn. was accomplished in 2 hrs. The dimethylpyridine was salted out from the water with K_2CO_3 and the aq. layer was extd. 5 times with ether. The yield of dimethylpyridine was 60-65%.

A. A. Podgorniy

ASB 314 METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND COPIES		3RD AND 4TH COPIES	
PROCESSING AND PROCESSING INFO			
CA	separation of codeine and morphine. M. P. Opatina U.S.P. 2,794,000, Feb. 24, 1957. Reaction with dilute from the methylation of morphine with trimethylphenyl- ammonium salts are treated with a dil. soln. of an al- kali bisulfite. Codeine and morphine collect in the bi- sulfite soln. from which they are pptd. with a soln. of NaCl. M. Hovch		17
ASB-564 METALLURGICAL LITERATURE CLASSIFICATION			
100000 HEP ONE ONE		100000 HEP ONE ONE	
100000 HEP ONE ONE		100000 HEP ONE ONE	

2.

Preparation of 2,3,5,6-tetramethylpyridine. M. P. Chayma, *Zhur. Obshchei Khim. (J. Gen. Chem.)* 19: 1151-5 (1949). Me₂CO (300 g) and 200 g 40% formalin passed at 50 g/hr over Al₂O₃ at 100-150° in a rapid stream of NH₃ in a Cu tube gave a series of products, b. 100-200°, from which the portion of the desired derivative was obtained by fractional crystals from EtOH, a total of 1.1 g (hydrate, m. 171-175°), obtained corresponded to 11% free 2,3,5,6-tetramethylpyridine, b. 197-8°/m. 81-2°. Oxidation by 0.0 g. KMnO₄ gave from 2.5 g. base, on heating a total of 1.0 hr. on a water bath, 2,6-dimethyl-3,5-pyridinedicarboxylic acid, needles, m. 307°, gives no red color with FeSO₄, conversion to the Cu salt by addition of Cu acetate gave no ppt., distn. with CaO gave 2,6-dimethylpyridine. Oxidation with an excess of KMnO₄ (24 hrs. on a steam bath) gave a crude tetra-carboxylic acid, isolated through a poorly sol. Cu salt and 1 g. salt. The acid did not m. 345° gave a red color with FeSO₄ and on heating to 190-200° lost CO₂ and yielded an acid, m. 183-4°, which does not give a color with FeSO₄. The mother liquor after removal of the 3,5-dicarboxylic acid gave on evapn. 0.4 g. 2,6-dimethyl-3,5-pyridinedicarboxylic acid, m. 248°. If the base (1.6 g.) is oxidized by 0.0 g. KMnO₄ (20 min.) the latter acid is obtained readily upon filtration, evapn., conversion to the Ag salt by AgNO₃, and treatment with H₂S, the pure acid m. 248° (decolorn. from H₂O), after neutralization with NaHCO₃ it gives a red color with FeSO₄, it does not give a ppt. with Cu acetate, its Ag salt is amorphous, the acid distl. with CaO yields 2,6-dimethylpyridine (hydrate, m. 163-5° while heating alone to 190-95° yields 2,6-dimethyl-3,5-pyridinedicarboxylic acid, m. 183-5°). (C. M. K.)

Lab. Heterocyclic Compounds,
Inst. Org. Chem., AS USSR

The action of bisulfite and bisuccinate of the alkali metals on pyridine and its homologs and on 2-aminopyridine. M. P. Churina, *Soviet State Obshch. Khim.*, 1963, 29, 1187-81 (1953); cf. C.A. 44, 1108f; Nisbet and Pryde, C.A. 46, 1004e. — The behavior of bases toward solus. of acid sulfites and acid succinates of the alkali metals depends on the basicity of the bases; strong bases (pH 8 or higher) are retained as salts, while weaker bases remain in the free state. Aminopyridine, as a strong base, is retained by the soln. of bisulfite and bisuccinate as a salt and can be recovered completely. NaHSO₃ causes no secondary reactions in pyridine or its homologs; pyridine and its weak base homologs remain in the free state, while picolines, lutelines and collidines are partly retained as salts. As basicity of the Me-substituted pyridine bases rises, the relative amt. of the base retained as salt on treatment with NaHSO₃ or K bisuccinate increases; thus, 2,3,5,6-tetramethylpyridine, which gives an alk. test with phenolphthalein, is readily retained in the form of a salt. G. M. K.